

Year Level: 9

Subject: Mathematics

Unit	Learning Focus	Victorian Curriculum
Number Fluency	Apply a wide range of mathematical processes to various problems, increasing fluency, accuracy and speed	recognise that the real number system includes the rational numbers and the irrational numbers, and solve problems involving real numbers with and without using digital tools (VC2M9N01)
TERM ONE		
Indices, Integers and Scientific Notation	Extend and apply the index laws to variables, using positive integer indices and the zero index. Apply index laws to numerical expressions with integer indices. Apply index laws to variables. Express numbers in scientific notation.	apply the exponent laws to numerical expressions with integer exponents and the zero exponent, and extend to variables (VC2M9A01) simplify algebraic expressions, apply the distributive law to expand algebraic expressions including binomial products, and factorise monic quadratic expressions (VC2M9A02)
Pythagoras' Theorem	Understanding and applying Pythagoras' Theorem. Finding the hypotenuse of a right-angled triangle. Finding a shorter side of a right-angled triangle.	solve spatial problems, applying angle properties, scale, similarity, ratio, Pythagoras' theorem and trigonometry in right-angled triangles (VC2M9M03)
Probability	Theoretical probability. Experimental probability. Relative frequencies. Two step chance experiments.	list all outcomes for two-step chance experiments both with and without replacement, using lists, tree diagrams, tables or arrays; assign probabilities to outcomes and events (VC2M9P01) calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and', inclusive 'or' and exclusive 'or' (VC2M9P02) design and conduct repeated chance experiments and simulations using digital tools to estimate probabilities that cannot be determined exactly (VC2M9P03)
TERM TWO		
Algebra	Simplifying algebraic expressions using the four operations (+, -, x, /) Understanding that the distributive law can be applied to algebraic expressions as well as numbers. Binomial expansions, including special cases of perfect squares and conjugate terms. Understanding the relationship between expansion and factorisation	apply the exponent laws to numerical expressions with integer exponents and the zero exponent, and extend to variables (VC2M9A01) simplify algebraic expressions, apply the distributive law to expand algebraic expressions including binomial products, and factorise monic quadratic expressions (VC2M9A02) identify and graph quadratic functions, solve quadratic equations graphically and numerically, and use null factor law to solve monic quadratic equations with integer roots algebraically, using graphing software and digital tools as appropriate (VC2M9A05)

	<p>and identifying algebraic factors in algebraic expressions</p> <p>Factorising the HCF, difference of two squares to produce a product of two conjugate terms</p> <p>Factorising quadratic expressions to produce a binomial product</p>	<p>experiment with the effects of the variation of parameters on graphs of related functions, using digital tools, making connections between graphical and algebraic representations, and generalising emerging patterns (VC2M9A07)</p>
Trigonometry & Geometry	<p>Understanding Trigonometry.</p> <p>Using Trigonometry to find side lengths and angles of right-angled triangles.</p> <p>Understand the characteristics of similar triangles and use ratio and scale factors to help find side lengths of similar figures.</p>	<p>recognise the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles using properties of similarity (VC2M9SP01)</p> <p>solve spatial problems, applying angle properties, scale, similarity, ratio, Pythagoras' theorem and trigonometry in right-angled triangles (VC2M9M03)</p> <p>apply the enlargement transformation to shapes and objects using dynamic geometry software as appropriate; identify and explain, using language of similarity, ratio and scale, aspects that remain the same and those that change (VC2M9SP02)</p>
Rates and Ratios	<p>Understanding direct proportion and solve simple rate problems.</p>	<p>use mathematical modelling to solve practical problems involving direct proportion, rates, ratio and scale, including financial contexts; formulate the problems and interpret solutions in terms of the situation; evaluate the model and report methods and findings (VC2M9M05)</p>
TERM THREE		
Linear and Non Linear Relationships	<p>Understanding simple equations, solving equations with brackets and solving equations with pronumerals on both sides.</p> <p>Finding a midpoint of a line segment on a graph.</p> <p>Sketch linear equations using different methods.</p> <p>Graph non-linear relationships.</p>	<p>find the gradient of a line segment, the midpoint of the line interval and the distance between 2 distinct points on the Cartesian plane (VC2M9A04)</p> <p>sketch linear graphs of equations in various algebraic forms, using the coordinates of 2 points, and solve linear equations (VC2M9A03)</p> <p>identify and graph quadratic functions, solve quadratic equations graphically and numerically, and use null factor law to solve monic quadratic equations with integer roots algebraically, using graphing software and digital tools as appropriate (VC2M9A05)</p>
Measurement	<p>Surface area and volume of cylinders, rectangular and triangular prisms.</p>	<p>solve problems involving the volume and surface area of right prisms, cylinders and composite objects using appropriate units (VC2M9M01)</p> <p>solve problems involving very small and very large measurements, timescales and intervals expressed in scientific notation (VC2M9M02)</p>
TERM FOUR		
Statistics	<p>Analyse data in a back-to-back stem and leaf plot.</p>	<p>analyse reports of surveys in digital media and elsewhere for information on how data was obtained</p>

	<p>Create histograms and describe and comment on the shape of the graph.</p> <p>Analyse and compare data displays using appropriate statistics.</p>	<p>around everyday questions and issues involving at least one numerical and at least one categorical variable, to estimate population means and medians (<u>VC2M9ST01</u>)</p> <p>analyse how different sampling methods, and different samples using the same method, can affect the results of surveys and how choice of representation can be used to support a particular point of view (<u>VC2M9ST02</u>)</p> <p>represent the distribution of multiple data sets for numerical variables using comparative representations such as back-to-back stem-and-leaf plots and histograms; describe data, using terms including 'skewed', 'symmetric' and 'bi-modal'; compare data distributions using mean, median and range to describe and interpret numerical data sets with consideration of centre, spread and shape, and the effect of outliers on these measures (<u>VC2M9ST03</u>)</p> <p>choose appropriate forms of display or visualisation for a given type of data; justify selections and interpret displays for a given context (<u>VC2M9ST04</u>)</p> <p>plan and conduct statistical investigations involving the collection and analysis of different kinds of data; report findings and discuss the strength of evidence to support any conclusions (<u>VC2M9ST05</u>)</p>
Financial Mathematics	Learn about simple interest and solve related problems.	use mathematical modelling to solve applied problems involving change, including financial contexts involving simple interest; formulate problems, choosing to use either linear or quadratic functions or other simple variations; interpret solutions in terms of the context; evaluate the model and report methods and findings (<u>VC2M9A06</u>)